PETROLEUM IN UTAH

Situation Analysis

Prepared by the Utah Energy Office
Department of Natural Resources

www.energy.utah.gov

Printed March 2004

STATE OF UTAH
NATURAL RESOURCES
Utah Energy Office

PETROLEUM IN UTAH: SITUATION ANALYSIS

Printed March 2004

Prepared by the Utah Energy Office
Thomas Brill, Director

Jon Allred, Energy Analyst
Michael D. Vanden Berg, Geologist
Glade Sowards, Energy Analyst

Cover photographs provided by Bureau of Land Management, Utah Energy Office, and Flying J Inc./Big West Oil Co.

Utah Energy Office
Department of Natural Resources
1594 West North Temple, Suite 3610
P.O. Box 146480
Salt Lake City, UT 84114-6480

TABLE OF CONTENTS

INTRODUCTION

Rapid economic growth in Utah during the 1990s greatly increased demand for refined petroleum products. Meanwhile, depletion of Utah oil fields is resulting in greater dependence upon supplies of crude oil and refined petroleum products from other states and Canada.

World events continue to affect the price and supply of crude oil in the United States. Military conflict in Iraq in 2003 and supply disruptions in Nigeria and Venezuela produced market volatility and consumer attention to retail prices. These conditions, combined with a major power outage in the eastern United States, a spike in natural gas prices, as well as lingering effects of the "California energy crisis," remind Utah residents of their increasing connection to events elsewhere. While conservation measures and increased equipment efficiencies have reduced energy intensity over the years, expansive consumer lifestyles have eroded many gains. Utah's total petroleum consumption is at an all-time high while crude oil production in Utah is at a 45-year low (Figure 1).

Petroleum prices, especially motor gasoline, will continue to occupy an important place in the minds of Utah citizens as world and national events remain turbulent and markets become increasingly interrelated. In recent years, the price of gasoline in Utah has grown by about $0.40 per gallon, and since the end of 2003 and early 2004, prices are rising again while commercial stocks are relatively low.

This report provides information on both the upstream and downstream sectors of Utah's petroleum situation and focuses primarily on data from 2002. Comments about 2003 and beyond were added when data were available, and historical trends were analyzed and discussed when appropriate. Additional data can be found in the appendix at the end of the report.

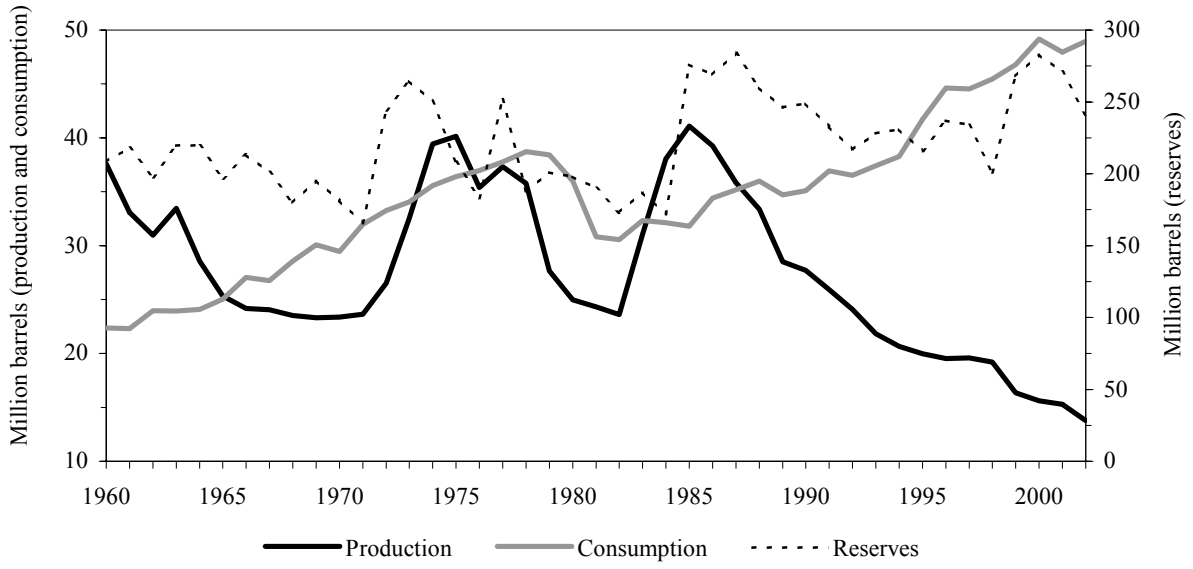

Figure 1. Crude oil production verses total petroleum consumption for the state of Utah. Reserves are also included.
Source: Utah Division of Oil, Gas and Mining (DOGM) and EIA

CRUDE OIL RESERVES

The U.S. Energy Information Administration (EIA) estimates the total U.S. proved crude oil reserves for 2002 at 22.7 billion barrels, or roughly 2.0 percent of proved world reserves. At 241.0 million barrels, Utah is ranked 10th among oil-producing states (not including federal offshore Gulf of Mexico reserves) with 1.1 percent of the nation's crude oil reserves (Figure 2). Utah reserves historically correlate to production with peaks in the 1960s, 1975 and 1985, the latter being the all-time highest reserves recorded at 284.0 million barrels (Figure 1). A similar reserve peak was recorded in 2000, but it did not correspond to an increase in production. This peak may reflect forthcoming enhanced oil recovery (EOR) technologies that can be applied to existing fields but have yet to increase production. Such technologies include waterflood projects and carbon dioxide flooding, as well as horizontal drilling.

Proved reserves are only estimates of the amount of recoverable crude oil in the ground. Substantial change from year to year is common because the definition of proved reserves is based, in part, on calculations of the feasibility of opening crude-bearing reservoirs to production as well as using EOR to increase production from existing fields. Feasibility, in turn, is largely an economic question that is affected by prevailing prices and, thus, profitability.

According to the EIA, U.S. reserves of crude oil are expected to decline from 22.7 billion barrels in 2002 to between 13.6 and 15.6 billion barrels by 2025. Projections of Utah proved reserves may depend more upon world crude oil prices than upon depletion of reserves by production.

Price volatility may increase as the United States looks to a wider variety of foreign countries for crude oil. Economic troubles in Russia and political problems in the Middle East, Nigeria and Venezuela may result in price pressure that affects the relative value of Utah crude, thus increasing the amount of recoverable reserves. Of particular interest to Utah are vast crude oil reserves in Canada that provide a growing fraction of Utah's refinery inputs. As Canada continues to explore tar/oil sand production as a means to meet domestic and export demands, its cost basis may rise making Utah crude relatively more attractive.

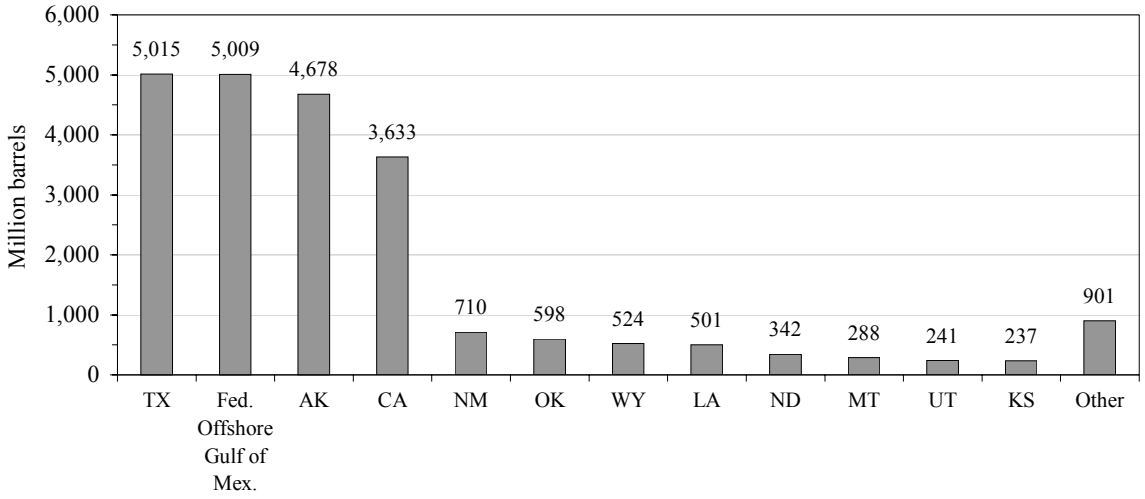

Figure 2. Crude oil reserves in the United States as of Dec. 31, 2002.
Source: EIA

CRUDE OIL PRODUCTION

OVERVIEW

The United States is one of the world's largest producers of crude oil. Domestic production totaled 2.1 billion barrels of crude oil in 2002, of which 13.8 million barrels, or 0.7 percent, was produced in Utah. Utah ranked 13th among oil-producing states in the United States, not including federal offshore areas (Table 1).

U.S. production of crude oil is in long-term decline after reaching a peak in 1970. Utah is among 25 oil-producing states that saw lower output in 2002. In fact, only six states saw a production increase over 2001. As a result, crude oil imports to the United States now account for more than 60 percent of domestic deliveries.

2002 State Rank	State	2001	2002	Percent Change 2001-2002
	Federal Offshore (Gulf Coast)	558,023	567,810	1.8
1	Texas	424,793	411,985	-3.0
2	Alaska	351,409	359,335	2.3
3	California	260,667	258,010	-1.0
4	Louisiana	104,918	93,477	-10.9
5	New Mexico	68,998	67,041	-2.8
6	Oklahoma	68,725	66,642	-3.0
7	Wyoming	57,436	54,717	-4.7
8	Kansas	32,736	32,721	0.0
9	North Dakota	31,693	30,993	-2.2
	Federal Offshore (California)	33,193	29,783	-10.3
10	Mississippi	19,530	18,015	-7.8
11	Colorado	19,554	17,734	-9.3
12	Montana	16,287	16,855	3.5
13	**Utah**	**15,274**	**13,771**	**-9.8**
14	Illinois	11,115	12,051	8.4
15	Alabama	9,346	8,631	-7.7
16	Arkansas	7,584	7,344	-3.2
17	Michigan	7,374	7,219	-2.1
18	Ohio	6,050	6,004	-0.8
19	Florida	4,426	3,656	-17.4
20	Nebraska	2,922	2,779	-4.9
21	Kentucky	2,970	2,679	-9.8
22	Pennsylvania	2,233	2,233	0.0
23	Indiana	2,023	1,962	-3.0
24	West Virginia	1,499	1,382	-7.8
25	South Dakota	1,255	1,214	-3.3
26	Nevada	571	553	-3.2
27	Tennessee	386	275	-28.8
28	New York	183	165	-9.8
29	Missouri	90	95	5.6
30	Arizona	60	63	5.0
31	Virginia	11	22	100.0
	U.S. Total	2,123,334	2,097,216	-1.2

Table 1. U.S. crude oil production by state (thousand barrels).
Source: EIA

Crude oil was discovered in Utah before 1900, and production and refining occurred prior to 1910. However, Utah oil fields did not become commercially valuable until 1948. The bulk of Utah's crude oil production history is highlighted by three distinct "boom" periods: 1958 through 1964, 1973 through 1978 and 1983 through 1988 (Figure 3). Since reaching an all-time peak in 1985 at 41.1 million barrels, Utah production has been declining by an average of 6.1 percent per year and declined by 9.8 percent from 2001 to 2002 alone.

PRODUCTION AREAS

Most Utah crude oil production comes from three distinct geologic regions: the Paradox Basin, which is the largest, the Uinta Basin, and a portion of the Wyoming overthrust belt that extends into Utah (Figure 4). Other small producing areas include the Kaiparowits Basin and the Green River Basin.

Utah's two highest producing oil fields were discovered during the 1950s: Greater Aneth, located in the Paradox Basin, and Bluebell, located in the Uinta Basin (Figure 4). These two fields have produced a cumulative total of 580.6 million barrels of oil and account for 46.6 percent of Utah's total historic production. Greater Aneth was discovered in San Juan County in 1956, and produced 4.8 million barrels in 2002, or 34.7 percent of Utah's total production for the year. Bluebell, which was discovered in 1955, straddles Duchesne and Uintah

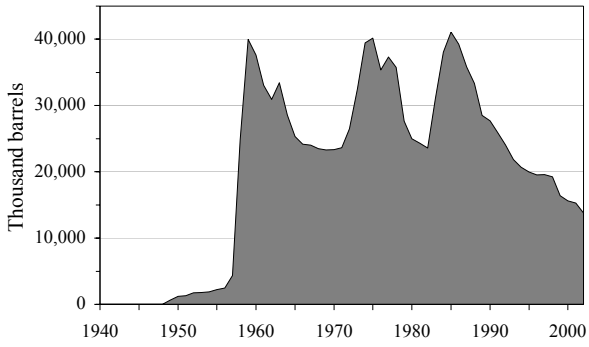

Figure 3. Historical crude oil production in Utah.
Source: DOGM and Bureau of Mines, Mineral Yearbooks

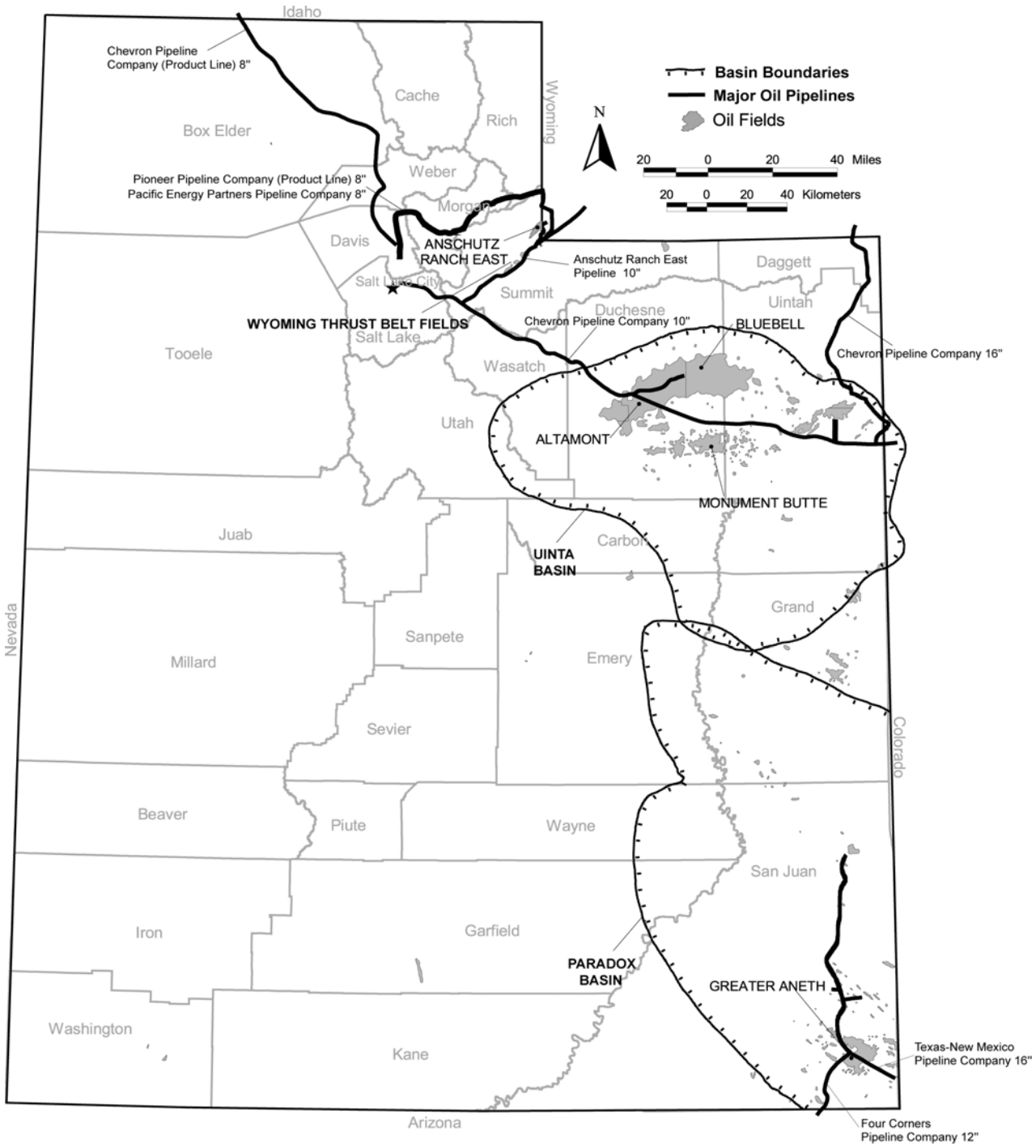

Figure 4. Location of Utah's oil fields and major oil pipelines.

Source: Utah Geological Society

Counties and produced 2.0 million barrels in 2002, or 14.7 percent of Utah's total.

Among Utah counties, San Juan County wells produced the most crude oil in 2002, at 5.2 million barrels, or 37.7 percent of Utah's total production for the year. Duchesne and Uintah Counties followed at 31.2 percent and 21.9 percent, respectively. Across time, a total of 12 counties in Utah have produced significant amounts of crude oil. At present, only nine counties report active wells, and all but Daggett,

Garfield and Grand Counties show declining production, consistent with state and national trends. Summit County production is dropping the fastest, down 27.6 percent from 2001.

OIL COMPANIES AND LANDOWNERSHIP

ExxonMobil Oil Corporation, the major operator of the Greater Aneth field, is currently the state's largest producer at 3.2 million barrels in 2002, 22.9 percent of Utah's total output for the year. ExxonMobil is also Utah's second leading all-time producer of crude oil at 4.5 percent of historic production behind Chevron USA, Inc. at 15.5 percent. ExxonMobil's relatively small portion of the state's historic production illustrates the dynamic nature of oil companies and shifting patterns of ownership and investment. In fact, the current top 25 oil producers in Utah account for 96.4 percent of Utah's 2002 production, but only 26.9 percent of Utah's total historic production.

In 2002, an estimated 27.1 percent of Utah's crude oil production came from wells on private and state-owned land. Native American and federal land produced an estimated 45.3 percent and 27.6 percent, respectively. Those shares are a major shift from 1960 when Native American lands produced 29.9 million barrels of crude oil, or 77.8 percent of Utah's total. Production on federal land peaked in 1967 at 11.8 million barrels of crude oil, while production from fee and state-owned land peaked in 1985 at 24.6 million barrels.

DRILLING ACTIVITY

In Utah, crude oil drilling has varied from a high of 332 wells in 1984 to a low of 12 wells in 1999 (Figure 5). Amount of drilling activity is loosely correlated with wellhead price, as illustrated in the early 1980s when both reached a high spike. However, a significant drilling increase during 1996 and 1997 is only related to a very small increase in wellhead price. In 2002, just 46 wells were drilled for crude oil, the second lowest year on record since 1960.

Development wells have been the dominant drilling type for the last 40 years with a long-term average of 79 wells per year. During the early 1980s, development wells averaged 154 wells per year, while 2002 saw only 34 development wells drilled. Extension wells followed a similar trend, but only averaged 11 wells per year since 1960. The practice of drilling in unproven areas has declined from an average of 23 wildcats per year (drilled only for oil) from 1981 through 1985 to an average of just one wildcat drilled per year during the past decade. The number of wells drilled, both development and exploratory, that prove dry each year varies widely, but overall has declined from a high of 111 failures in 1981 to just three dry wells in 2002.

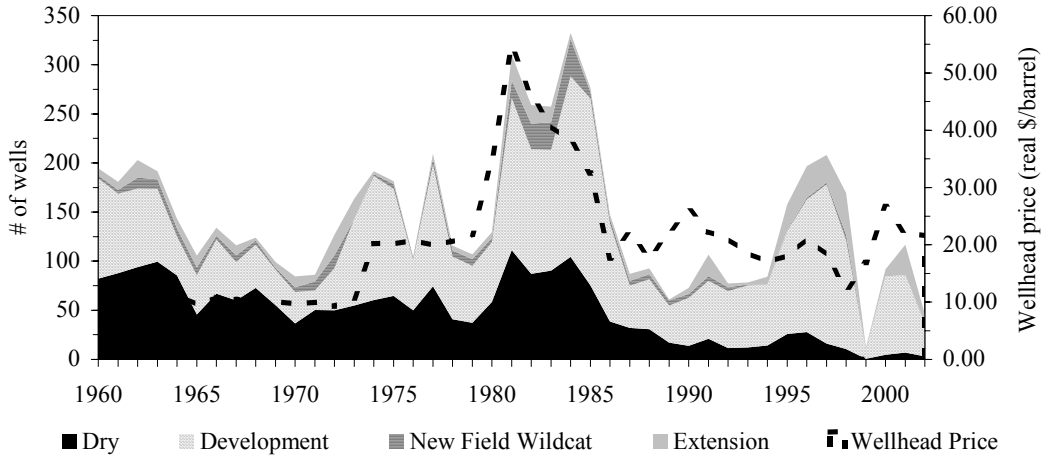

Figure 5. Drilling activity in Utah plotted against wellhead price.
Source: EIA and DOGM

An inverse relationship between the rising number of producing oil wells and the ever decreasing amount of production per well demonstrates one of the reasons overall crude oil production in Utah has been on the decline (Figure 6). As fields are depleted, it takes many more wells to extract smaller amounts of oil; this in turn increases the overall extraction cost. In 1960, average production per well was 47,200 barrels per year, but declined by 85.1 percent to only 7,000 barrels per year in 2002. Nevertheless, this downward trend does contain two significant spikes. One spike occurred in 1974 when production per well averaged 36,700 barrels per year and a second spike occurred in 1986 when production averaged 22,400 barrels per year. In contrast, the number of producing oil wells has increased from 796 in 1960 to a high of 2,085 in 1991. Since then, the number of oil wells has to some extent leveled off and was 1,957 in 2002.

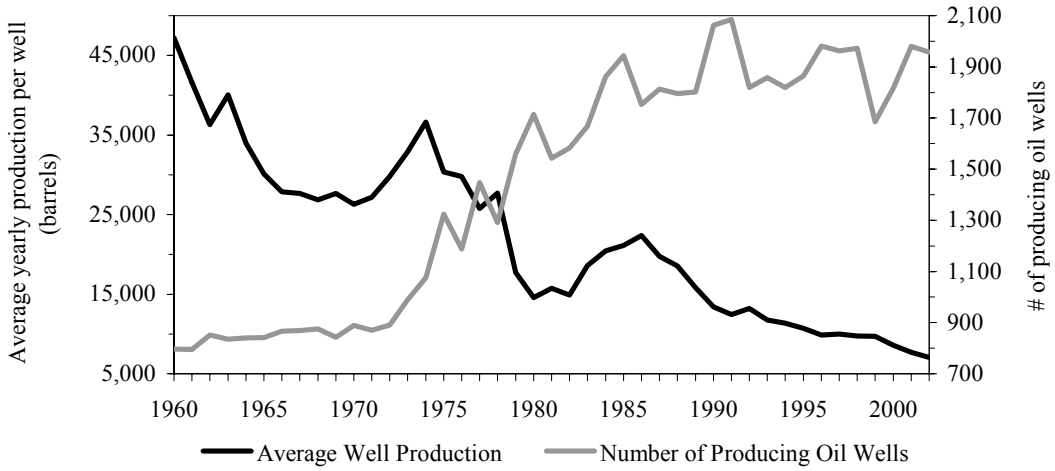

Figure 6. Average yearly crude oil production per well in Utah verses number of producing oil wells.
Source: EIA and DOGM

STRIPPER WELLS

An increasing percentage of U.S. domestic crude oil production comes from low-volume "stripper" wells that typically produce between 0.5 to 20.0 barrels per day. In 2002, stripper wells in the United States together produced a daily average of 2.2 barrels of oil per well, for a combined total production of 323.8 million barrels or 15.9 percent of the nation's total crude oil production.

Utah produced comparable totals for 2002 with 10.5 percent of the state's total crude oil production coming from its 1,049 stripper wells (Table 2). On average, each Utah stripper well produced 3.8 barrels of crude oil per day in 2002, accumulating a total production of 1.5 million barrels for the year. That contrasts with a rate of 7.1 barrels per day in 1991 when total stripper well production in Utah reached 2.6 million barrels. That difference amounts to a production decline of 43.4 percent between 1991 and

Year	Number of Stripper Wells	Production from Stripper Wells	Total Production	Percent Oil Production from Stripper Wells
		barrels	barrels	
1991	992	2,554,211	25,927,639	9.85
1992	1,028	2,361,588	24,073,573	9.81
1993	1,011	2,470,262	21,825,986	11.32
1994	1,067	2,572,038	20,667,621	12.44
1995	1,181	1,344,294	19,975,648	6.73
1996	876	1,258,718	19,528,780	6.45
1997	821	1,167,482	19,592,548	5.96
1998	838	1,113,425	19,218,109	5.79
1999	898	1,302,804	16,361,751	7.96
2000	943	1,418,314	15,609,169	9.09
2001	1,043	1,449,051	15,273,995	9.49
2002	1,049	1,445,945	13,771,204	10.50
Average				8.78

Table 2. Stripper oil well production in Utah.
Source: Interstate Oil and Gas Compact Commission

2002. Overall, crude production in Utah declined by 46.9 percent over that same period. Among U.S. states with stripper wells, all but three derived a larger percentage of their total crude production from stripper wells than did Utah in 2002. This fact helps illustrate the extent to which the United States has depleted its high-volume oil fields.

OUTLOOK

Both Utah and the United States will be challenged to prevent continuing long-term decline in crude oil production. In the short term, the EIA predicts crude oil production in the lower 48 states will increase from 1.7 billion barrels in 2002 to 1.9 billion barrels per year by 2008, then decline to 1.5 billion barrels per year by 2025. Utah crude oil production is predicted to total 13.0 million barrels in 2003, a 46-year low, with little hope of returning to production totals seen 20 years ago. Enhanced oil recovery methods may improve production and increase recoverable reserves, but at higher cost. In addition, many studies are underway in hopes of discovering additional large-scale producing fields. However, new fields and new technology will struggle to even put a dent into Utah's increasing petroleum demand. As a result, Utah will become increasingly reliant on crude oil imports from other states and Canada.

REFINERY ACTIVITY

UTAH REFINERIES

Utah is host to five crude oil refineries with a combined distillation capacity of 162,700 barrels per calendar day. The largest two, Tesoro West Coast and Chevron U.S.A., with capacities of 58,000 and 45,000 barrels per day, respectively, are both located in Salt Lake City. Holly Refining and Marketing, formerly Phillips 66 Company, has a capacity of 24,700 barrels per day and is located in Woods Cross. Big West Oil Company, with a 24,000 barrels per day capacity, is located in North Salt Lake. The smallest of the five, Silver Eagle Refining, formerly Inland Refining Inc., has a capacity of 11,000 barrels per day and is also located in Woods Cross.

PIPELINES

Utah refineries are served by two crude oil pipelines: a Chevron line from Colorado and a Pacific Energy Partners line (formally the Amoco line) from Wyoming (Figure 4). Both pipelines currently deliver crude originating in Wyoming, Colorado, and Utah. Also, the Chevron line is delivering crude from Canada via Wyoming, whereas the Pacific Energy Partners line delivered Canadian crude only from 1997-2001.

Significant amounts of refined petroleum products are delivered to North Salt Lake from the Sinclair refinery in Wyoming via the Pioneer Pipeline. Refined petroleum products leave Utah via the Chevron pipeline, which serves Hill Air Force Base and the Salt Lake City Airport before going on to Idaho and Washington. Refined products for parts of southwestern Utah arrive by truck from Las Vegas, while most products for southeastern Utah are from Farmington, New Mexico.

REFINERY RECEIPTS

Refinery receipts have grown from 30.9 million barrels in 1960 to an all-time peak of 50.0 million barrels in 1998. As of 2002, receipts have declined by a small amount to a total of 48.4 million barrels (Figure 7).

The amount of crude oil from Utah wells going to Utah refineries has declined from an all-time high 24.2 million barrels in 1985 to just 4.3 million barrels in 2002; a 80.5 percent decline. This trend highlights Utah's growing dependence on out-of-state crude oil sources for its refineries. In 2002, non-Utah crude comprised 91.0 percent of refinery receipts, the second highest behind 2000 when non-Utah sources reached 94.0 percent.

Geography and chemistry help explain the declining portion of Utah crude oil refined instate. Due to its remoteness from Salt Lake refineries, the majority of crude oil produced in San Juan County is

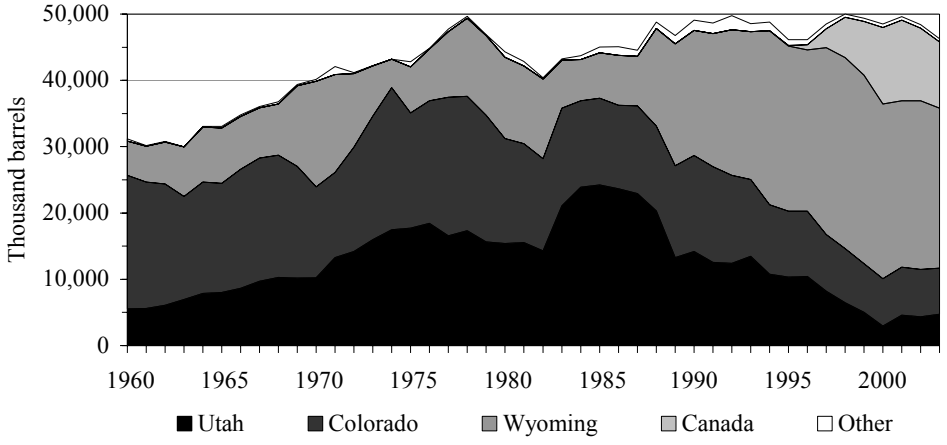

Figure 7. Utah refinery receipts of crude oil by state of origin.
Source: Utah Energy Office (UEO) and EIA

sent to New Mexico. Also, crude oil produced from Utah's portion of the Wyoming overthrust area is sent to Wyoming because Utah refineries are better suited for the waxy crude oils which predominate in the Uinta Basin. Consequently, in 2002, roughly 65.8 percent of Utah crude production was sent to other states for refining.

The vast majority of Utah crude that does make it to Utah refineries is from the Uinta Basin. Much of the Uinta Basin black wax crude oil is added to Chevron's pipeline, which passes through the area carrying crude from Colorado and Wyoming. In addition, higher-value yellow wax crude goes by heated truck from Uintah and Duchesne Counties to Salt Lake City.

Refinery receipts from Colorado diminished from 20.2 million barrels in 1960 to 7.1 million barrels in 2002 (Figure 7). Meanwhile, Wyoming receipts increased commensurately, from 5.2 million barrels in 1960 to 28.5 million barrels in 1999. Receipts from Wyoming totaled 25.5 million barrels in 2002.

Canada has increasingly become an important crude oil supplier for Utah, since Canadian crude first appeared at Utah refineries in 1995 with 60,000 barrels delivered. This amount grew to a high of 12.2 million barrels in 2001 before declining a small amount to 11.0 million barrels in 2002. It is predicted that Canada will continue to supply significant amounts of crude to Utah as in-state production continues to decline.

Finally, a small portion of Utah's refinery receipts come from Nevada, Montana and New Mexico. After reaching a high of 2.2 million barrels delivered in 1992, estimated receipts from these states have since diminished to a few hundred thousand barrels per year.

REFINING CAPACITY AND UTILIZATION

Refinery capacity in Utah grew steadily from 1960, when total capacity was 97,000 barrels per day, until 1984, when capacity reached an all-time high of 169,400 barrels per day (Figure 8). Due to falling demand for petroleum and industry deregulation, refinery capacity dropped sharply in 1985 and 1986 before leveling off at 154,500 barrels per day between 1988 and 1994. A second decline occurred between 1995 and 1996 when capacity sagged to 146,500 barrels per day, but has since recovered, reaching 162,700 barrels per day in 2002.

In 2002, Utah refineries processed an average of 132,600 barrels per day, running at 81.5 percent utilization of capacity (Figure 8). That rate is down from 83.2 percent utilization in 2001 and off considerably from the 87.5 rate recorded in 1992. During the years 1966 through 1974, rates of utilization were always above 90 percent. Refiners took advantage of available capacity in 2001 by recording the third largest crude oil run since 1960 for a total of 49.5 million barrels during the year. Runs of similar size were recorded in 1998, 1992 and 1978.

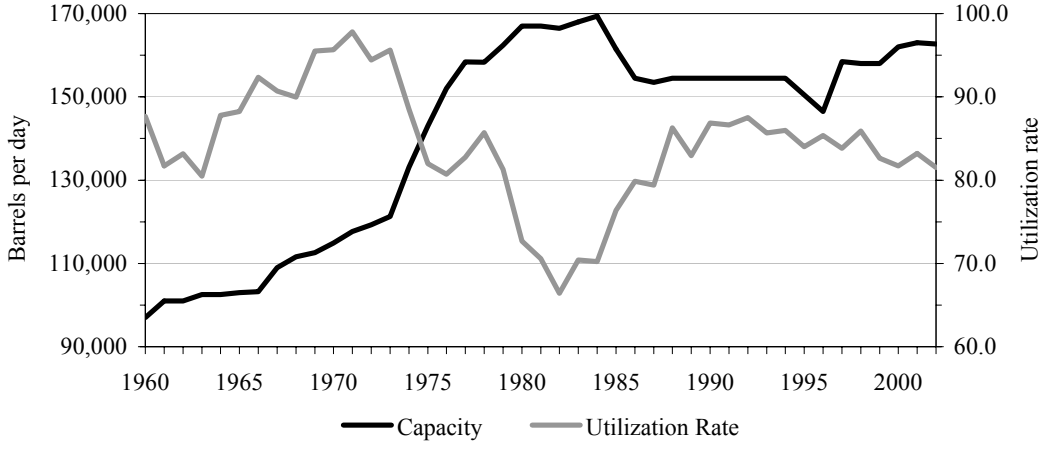

Figure 8. Petroleum Refinery Utilization and Capacity in Utah.
Source: UEO

REFINING CAPABILITY

Converting crude oil into finished petroleum products generally occurs by either simple distillation or by more complex "cracking" of compounds that would otherwise not separate easily. Vacuum distillation capacity at Utah refineries is limited to a combined total of 37,300 barrels per day, or 22.9 percent of overall refining capacity. Chevron is the only refinery with a majority of its plant capacity in distillation. All of the other refineries have relatively larger capacities in various forms of cracking: thermal, catalytic or hydro. Among cracking types, all Utah refineries except Silver Eagle have catalytic cracking capability, at a combined daily volume of up to 55,900 barrels. Tesoro conducts no distillation at all, relying instead on the various types of cracking. The cracking capacity of the other refineries is commensurate with their overall refining capacity. All Utah refineries conduct catalytic reforming with a combined capacity of 35,000 barrels daily.

Silver Eagle is the only Utah refinery that does not produce alkylates or sulfur and is the only refinery with a stated capacity for hydrogen production. Utah's other refineries can produce up to a combined total of 53 tons per day of sulfur. Two refineries, Holly and Silver Eagle, can produce up to a combined daily total of 3,300 barrels of asphalt and road oil.

STOCKS

In 2002, Utah's five crude oil refineries began the year's production with stocks totaling more than 3.1 million barrels. Of these, 1.2 million barrels were in gasoline and its components, 1.0 million barrels were in crude or unfinished oils and 532,000 were in distillate and residual oils. Another 195,000 barrels were in the form of various other hydrocarbons. Compared with 2001, beginning stocks in 2002 were 18.4 percent higher.

REFINING

Utah refineries received a total of 55.2 million barrels in 2002, of which 48.4 million barrels, or 87.7 percent, was crude oil (Table 3). The remaining 12.3 percent were petroleum products such as motor gasoline, distillate fuel and natural gas liquids. The total receipts for 2002 were 0.9 percent lower than totals for 2001.

Product Description	Beginning Stocks		Receipts		Inputs		Production		Shipments		Ending Stocks	
	2001	2002	2001	2002	2001	2002	2001	2002	2001	2002	2001	2002
Crude Oil	454	533	49,597	48,394	49,509	48,405	0	0	9	0	533	422
Unfinished Oils	413	506	435	690	1,215	1,479	891	759	1	81	506	395
Motor Gasoline (Oxygenated Gasoline, Other Finished Gasoline)	450	552	0	194	0	1	26,759	26,672	26,656	26,928	552	488
Gasoline Blending Components	424	654	347	441	1,173	1,312	1,881	1,691	769	747	654	726
Finished Aviation Gasoline	w	w	w	w	w	w	w	w	w	w	w	w
Jet Fuel-Kerosene Type	142	146	0	0	3	5	4,935	4,716	4,928	4,726	146	131
Kerosene	w	w	w	w	w	w	w	w	w	w	w	w
Distillate Fuel Oil	556	482	2,042	2,213	1,327	1,194	16,495	16,613	17,283	17,364	482	750
Residual Fuel Oil	54	50	1	11	0	0	976	817	935	830	50	36
Wax	w	w	w	w	w	w	w	w	w	w	w	w
Petroleum Coke-Marketable	w	w	w	w	w	w	w	w	w	w	w	w
Petroleum Coke-Catalyst	0	0	0	0	0	0	875	817	0	0	0	0
Still Gas	0	0	26	17	26	17	1,955	1,952	25	14	0	0
Products of Natural Gas Proc. Plants (Butane, Isobutane, Pentanes Plus)	10	12	1,671	1,699	1,669	1,695	0	0	0	0	12	16
Other Hydrocarbons, Hydrogen and Oxygenates	13	18	60	70	41	47	0	0	16	34	18	29
Isobutane (incl. Isobutylene) - LRG	22	27	707	723	715	689	359	282	342	322	27	22
Propane (incl. Propylene) - LRG	30	80	0	0	0	1	655	658	597	655	80	79
n-Butane (incl. Butylene) - LRG	66	58	772	720	857	830	387	375	310	288	58	35
Other Products-Non Fuel	w	w	w	w	w	w	w	w	w	w	w	w

w = Withheld to avoid disclosure of individual company data

Table 3. Refinery activity in Utah, 2001-2002 (thousand barrels).
Source: UEO

Production of petroleum products at Utah refineries totaled 55.4 million barrels in 2002, a decline of 1.5 percent from 2001. Motor gasoline accounted for 48.2 percent of total products produced, followed by distillate fuel at 30.0 percent and jet fuel at 8.5 percent. Other products produced in smaller quantities include still gas, residual fuel, petroleum coke and liquefied refinery gases (LRGs).

Shipments in 2002 totaled 52.0 million barrels, only 0.2 percent higher than in 2001. Again, motor gasoline was the product shipped in the greatest quantity, accounting for 53.2 percent of all deliveries. Distillate fuel was the second largest with 33.4 percent of the total, followed by jet fuel at 9.1 percent.

OUTLOOK

The EIA predicts that increases in U.S. domestic refining capacity will depend upon expansion of existing refineries rather than construction of new ones. The EIA also predicts that motor gasoline, distillate and jet fuel will be an increasing share of U.S. refinery output, at the expense of residual fuel oil. Based on long-term trends, the same will be true in Utah where gasoline and distillate demand are growing faster than other products and residual fuel deliveries are in decline.

CONSUMPTION OF PETROLEUM PRODUCTS

U.S. PETROLEUM BALANCE

World consumption of petroleum products reached 28.4 billion barrels during 2002. The United States consumed 7.2 billion barrels of that total, an astounding 24.9 percent. Since 1985, the gap between U.S. crude oil production and consumption has steadily widened with the difference between the two reaching 5.1 billion barrels in 2002 (Figure 9). In order to help make up this gap, the United States imported 4.1 billion barrels of crude oil in 2002. The other one billion barrels comes from various sources such as natural gas liquids.

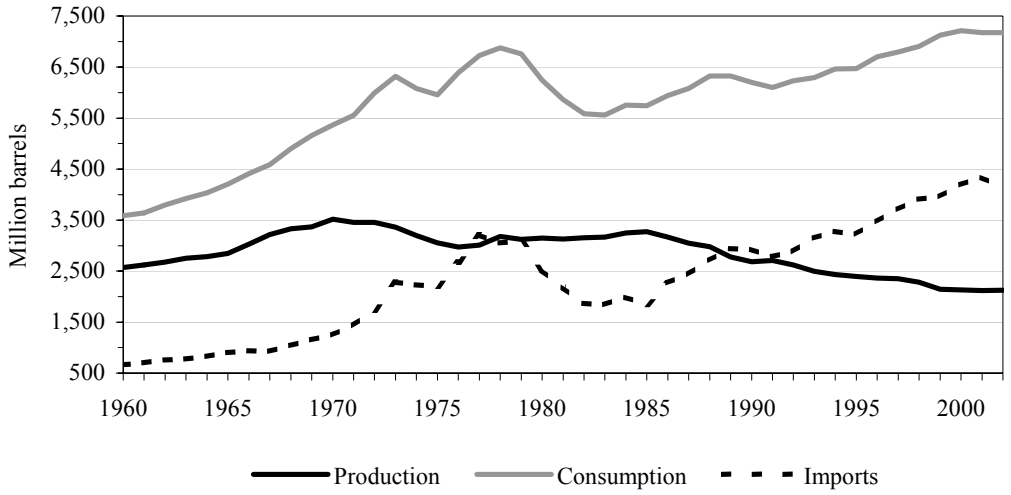

Figure 9. U.S. petroleum balance: crude production, consumption and imports.
Source: EIA

UTAH PETROLEUM BALANCE[1]

Since 1960, the state of Utah has averaged approximately 0.6 percent of the nation's total petroleum consumption (since 1996, that percentage has been slightly higher, 0.7 percent, than the long-term average). In 2001, petroleum product consumption per resident in Utah was 20.9 barrels, with Utah ranking 35th among states. This ranking and consumption per capita are expected to remain the same for 2002.

Consumption of petroleum products in Utah exceeded in-state crude oil production for the first time in 1966 (Figure 1). In that year, consumption totaled 27.1 million barrels, and in-state production dropped to 24.2 million barrels, a decline of 4.6 percent over the previous year. The gap between in-state demand and in-state production has widened since then except for two peak periods of high crude production, 1974-1975 and 1984-1987. In 2002, overall consumption rose by 2.1 percent despite slow economic conditions. Crude production in Utah, like all commodities, is sensitive to market prices. However, there is no evidence that world crude oil prices will increase enough to stimulate Utah crude production commensurate with in-state demand.

CONSUMPTION BY PETROLEUM PRODUCT

Motor Gasoline

Motor gasoline has always been the most popular petroleum product in Utah (Figure 10). In 1960, gasoline consumption totaled 7.8 million barrels, or

[1] 2002 consumption data for Utah was estimated by the Utah Energy Office

35.0 percent of all petroleum products consumed in the state. By 2002, that percentage had risen to 48.6 percent or 23.8 million barrels, which is near the all-time record of 23.9 million barrels reached in 2000. The 16.1 million barrel increase in gasoline consumption from 1960 to 2002 represents 60.1 percent of the total increase in petroleum product consumption for that period. In between those years, interim peaks in gasoline consumption occurred in 1978 and 1988, when Utah consumed 17.5 and 18.2 million barrels, respectively.

Distillate Fuel

Distillate fuel is the second largest fraction of Utah demand for petroleum. Consumption reached an all-time peak at 11.2 million barrels in 2001, or 23.4 percent of all petroleum products consumed that year, before declining 3.0 percent to 10.9 million barrels in 2002.

Distillate consumption in 1960 totaled just 3.8 million barrels, or 16.9 percent of all petroleum consumed in the state. The 7.1 million barrel increase in distillate consumption from 1960 through 2002 represents 26.8 percent of the state's total increase in consumption for that period.

Residual Fuel

Years ago, residual fuel was widely used for power generation as well as being important for the commercial and industrial sectors. In 1960, Utah burned 5.7 million barrels of residual fuel, or 25.6 percent of all Utah petroleum consumed. Residual fuel use has declined since then, with its sharpest drop between 1976 and 1985. Use of that fuel dwindled to just 18,000 barrels in 2001 before increasing slightly to 31,000 barrels in 2002. The significant decline in residual fuel use over the last 40 years is due to at least three factors: heavy reliance on coal for power generation in Utah since the 1980s; increasing use of natural gas for peaking capacity at power plants in the 1990s and replacement of fuel oil by natural gas in business and industry.

Jet Fuel, Aviation Gasoline and Other Fuels

Consumption of jet fuel, aviation gasoline, kerosene and other fuels in 1960 totaled 2.1 million barrels. Aviation fuel consumption has declined considerably as commercial air travel converted to primarily heavy jets and as the general aviation industry declined due to product liability and other economic issues. By 2002, aviation gasoline use had declined to just 67,000 barrels while jet fuel consumption climbed to 7.0 million barrels. Kerosene use that totaled 36,000 barrels in 1960 reached an all-time peak of 650,000 barrels in 1968 and then declined to 17,000 barrels by 2002. In contrast, LPG use that totaled 452,000 barrels in 1960 rose to 2.1 million barrels by 2002.

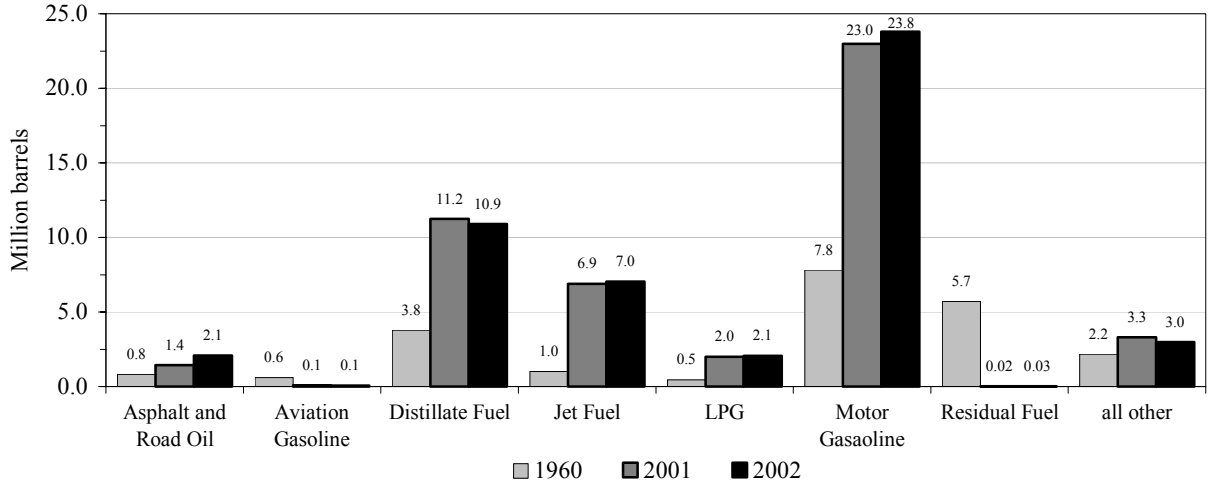

Figure 10. Petroleum products consumed in Utah, 1960, 2001 and 2002.
Source: EIA and UEO

Asphalt and Other Products

From 1960 through 2002, consumption of asphalt and road oil in Utah rose by 155.4 percent to 2.1 million barrels, consistent with a substantial increase in the total mileage of streets and highways in Utah. Meanwhile, consumption of lubricants changed relatively little, rising from 214,000 barrels in 1960 to 300,000 barrels in 2002. Lubricants are not produced at any of Utah's oil refineries.

CONSUMPTION BY ECONOMIC SECTOR

Transportation

Motor vehicles, railroads and aviation consume an expanding majority of petroleum products in Utah, the nation and the world. Record-level consumption by Utah's transportation sector occurred in 2000 on 40.0 million barrels (Figure 11). In 2002, transportation fuel consumption declined slightly to 39.9 million barrels. By comparison, in 1960 the transportation sector consumed 11.7 million barrels, or 52.4 percent of all petroleum products consumed in Utah that year. That share has expanded year-by-year and, as of 2002, the transportation sector consumed 81.5 percent of the state's petroleum products.

Commercial

The Utah commercial sector consumed 926,000 barrels of petroleum products in 2002, a slight gain of 0.4 percent over 2001 and 80.5 percent higher than 2000 when commercial consumption was only 513,000 barrels. Between 1981 and 2000, the Utah commercial sector consumed an annual average of just 674,000 barrels of petroleum products. For the period 1960 through 1980, consumption averaged 2.1 million barrels per year. In fact, even in 1960, when Utah's economy was much smaller than today, the commercial sector consumed 1.3 million barrels of product, roughly 1.5 times more than in 2002. Across time, these changes are likely due to a shift to natural gas use for building space conditioning.

Industrial

Industrial consumption is a diminishing portion of the overall energy economy, both in Utah and nationally. The all-time high point for industrial use of petroleum in Utah occurred in 1976, when 11.7 million barrels were consumed. That year's total represented a 73.8 percent increase over 1960 consumption of just 6.6 million barrels. After 1979, industrial petroleum consumption declined to an average of just 7.3 million barrels per year, which is consistent with 2002 consumption.

Residential

Utah residents consumed 763,000 barrels of petroleum products in 2002, a decline of 30.4 percent from a record year consumption of 1.1 million barrels in 2001. In fact, 2001 consumption was 63.2 percent higher than just the year before. In turn, 2000 consumption was 69.7 percent higher than 1999 consumption of 396,000 barrels of petroleum

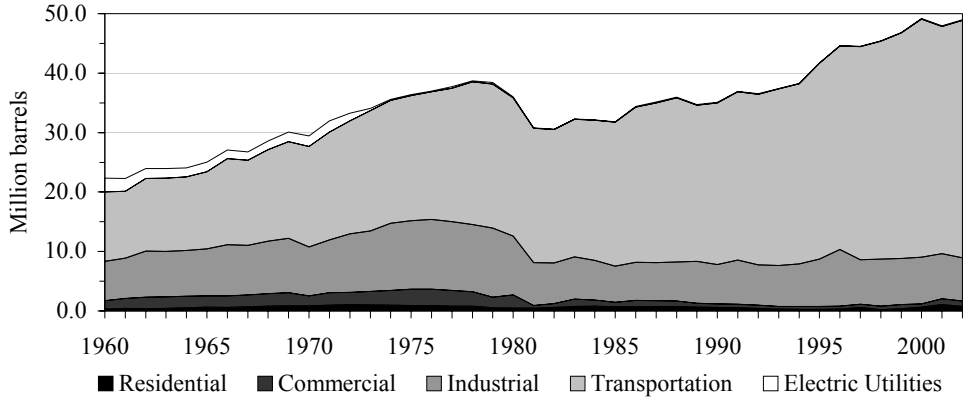

Figure 11. Consumption of petroleum products in Utah by end use.
Source: EIA and UEO

products. Residential use in Utah reached a historic low of just 222,000 barrels in 1998 before recovering in successive years. Overall, the quantity of petroleum products used by Utah residents has varied widely between years, but consumption in 2002 is still comparable to average annual consumption of 646,000 barrels from 1960 to 2002.

Electric Utilities

Petroleum consumption at electricity generation plants in Utah averaged 102,000 barrels per year from 2000 through 2002. That level is much higher than for the preceding decade, 1990-1999, when an annual average of just 65,000 barrels was consumed by electric utilities. Over a longer time frame, however, petroleum use at utilities is in decline. In 1960, electric utilities consumed 2.3 million barrels of petroleum products. Consumption in 2002 totaled just 96,000 barrels, down from 110,000 barrels in 2001.

OUTLOOK

The EIA estimates that petroleum consumption in the United States will rise by 1.6 percent per year from 2002 to 2025. Based on EIA's long-term forecasts, Utah petroleum consumption could rise by as much as 2.5 percent per year over the same period of time. Specifically, distillate fuel use in Utah is projected to grow by an estimated 3.5 percent per year, jet fuel by 2.5 percent and motor gasoline by 2.9 percent per year.

In Utah, transportation is by far the largest consuming sector at 81.5 percent of all petroleum consumption and is expected to increase its share over time. The transportation sector's consumption of natural gas and other alternative fuels is expected to continue its gradual increase, but on a national level, still only represents less than one percent of all transportation-related vehicle consumption. The residential, commercial and industrial sectors are projected to decrease their petroleum consumption since they have become increasingly dependent on natural gas. Finally, electric power generation will continue to be dominated by low-cost coal.

CRUDE OIL AND OTHER PETROLEUM PRICES

CRUDE OIL

The relatively small increase in U.S. crude oil prices since a low point in 1998 does not compare with the period between 1980 and 1985 when adjusted crude prices sailed to a high of $55.04[2]. Figure 12 shows that, for the United States as a whole, the average 2002 price of crude oil is moderate compared with historic times. Figure 13 shows daily crude oil prices (West Texas Intermediate [WTI] Cushing spot prices) from January 1, 2000 through February 10, 2004. Prices for this time period have remained relatively constant except for a six-month drop after September 11, 2001, and a war-related spike in February and early March of 2003.

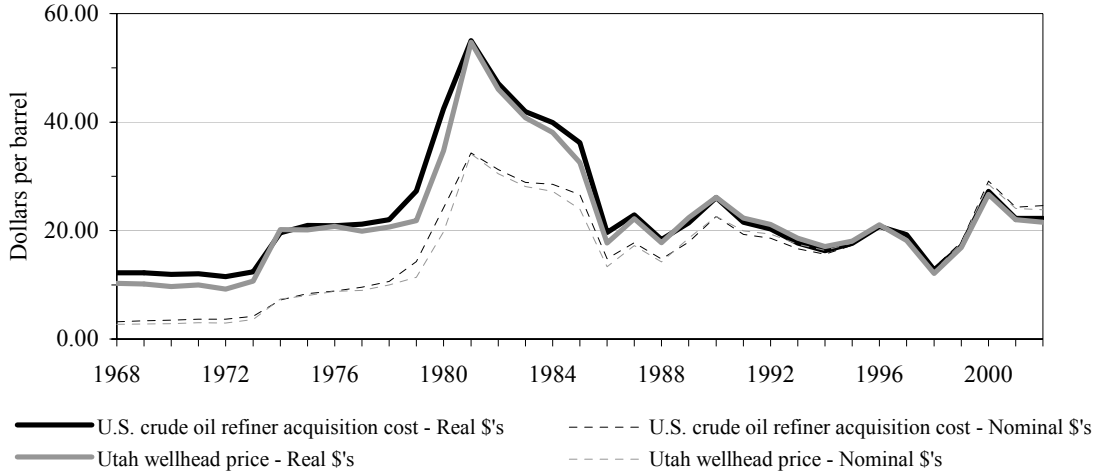

Figure 12. U.S. verses Utah crude oil prices.
Source: EIA

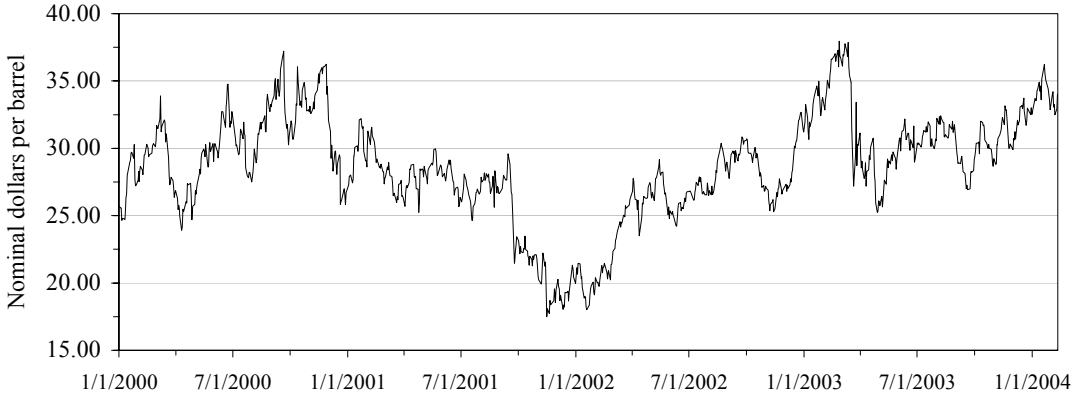

Figure 13. Daily WTI Cushing crude oil spot price, Jan. 1, 2000 - Feb. 10, 2004.
Source: EIA

Utah's adjusted crude oil wellhead price does not vary significantly from the overall U.S. refiner acquisition cost (Figure 12). Utah crude sold for just $10.30 per barrel in 1968, peaked at $54.74 in 1981, and then, after 1985, remained fairly steady ending at $21.57 in 2002. Utah wellhead price experienced the

[2] Prices adjusted for inflation using the gross domestic product implicit price deflator from the EIA.

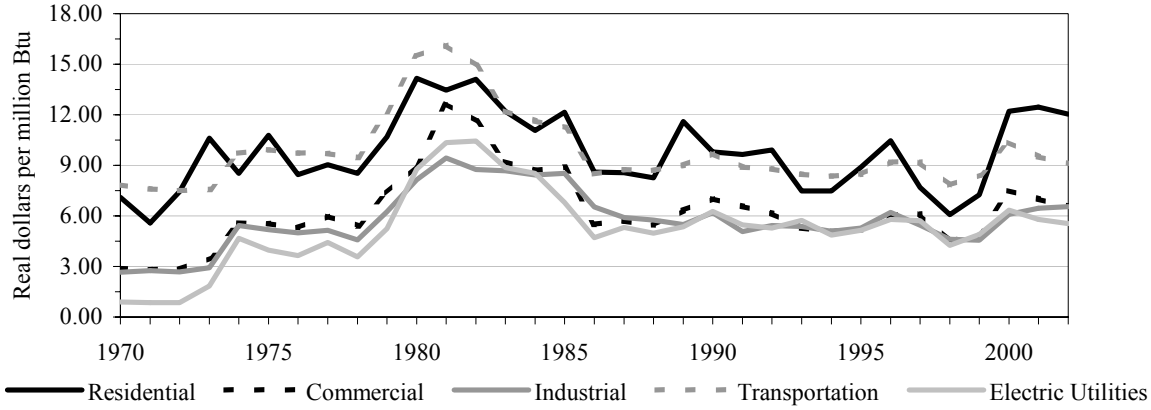

Figure 14. End-use price (real) of petroleum products in Utah.
Source: EIA

same slump as the United States in 1998, but then recovered to $26.69 in 2000.

END-USE PRICES

In 2001, Utah's average end-use price of petroleum was $10.03 per million British thermal units (Btu), the 21st highest among all states and the District of Columbia. The average end-use price of petroleum products in Utah for the commercial, industrial and electric utilities sectors has moderately increased over the last 30 years, while residential and transportation prices have remained more consistent (Figure 14). An exception occurred in the early 1980s when all sectors experienced a major price spike. This spike correlates to a rise in wellhead price and a decline in overall consumption (see Figure 1). A similar increase, albeit somewhat smaller than the early 1980s increase, was recorded between 1998 and 2000. Utah's residential sector saw the greatest increase during this time, as prices nearly doubled from $6.05 per million Btu in 1998 to $12.05 in 2002[3].

MOTOR GASOLINE

Motor gasoline prices are of considerable interest to consumers, especially the retail price of regular unleaded. Figure 15 shows that regular unleaded prices for Salt Lake City were relatively constant from 1989 to 1999, averaging $1.15 per gallon. After 1999, prices sailed to an average of $1.48 in 2000, $1.40 in 2001, $1.34 in 2002, and then jumped once more to an average of $1.52 per gallon for 2003. Again, a significant price drop occurred after September 11, 2001, and prices did not recover until roughly a year later. Figure 15 also shows that gasoline prices in Salt Lake City are generally $0.02 to $0.05 cheaper than the national average. For Utah as a whole, motor gasoline prices are closer to the national average. Although the difference is highly variable, between 1998 and 2003 prices ranged from $0.14 more expensive to $0.13 cheaper than the national average; Utah prices for this time period averaged $0.01 more than national prices.

The fluctuations seen within the weekly data in Figure 15 are annual cycles. Prices are generally more expensive in the summer and fall, peak driving months, while they are typically cheaper in the winter and spring.

DIESEL FUEL

Diesel prices in Petroleum Administration for Defense (PAD) District 4, the Rocky Mountain Region, have typically followed the same trends as motor gasoline prices (Figure 16). A dip was seen in the early 1999s as well as just after September 11, 2001. Prices have since recovered and are currently hovering around $1.55 a gallon, roughly $0.05 to $0.10 cheaper than regular unleaded gasoline. Diesel

[3] Prices adjusted for inflation using the gross domestic product implicit price deflator from the EIA.

prices in the Rocky Mountain Region between 1994 and 1999 averaged $0.05 higher than the national average, while between 2000 and early 2004, prices averaged $0.03 higher.

JET FUEL

Jet fuel prices in Utah have also followed general fuel trends with lower prices in early 1999 and after September 11, 2001 (Figure 17). Jet fuel prices fell to a five-year low in January of 1999 with a price of $0.44 per gallon (excluding taxes). The highest price in the last five years was recorded in November of 2000 with a price of $1.15. As of December 2003, prices were near $1.00 a gallon. Between 1998 and 2003, jet fuel prices in Utah were typically about $0.09 higher than the national average.

MOTOR FUEL TAXES

The current federal tax on motor gasoline is 18.4 cents per gallon, while the average state tax is 20.5 cents per gallon. The current motor gasoline state tax in Utah is 24.5 cents per gallon, making Utah the 11th highest among states. The current tax rate has been in place since July of 1997, when a five-cent increase was implemented. In total, Utahns pay a total of 42.9 cents in taxes per gallon of motor gasoline. Diesel fuel taxes are comparable, with federal tax equaling 20.7 cents per gallon and Utah state tax equaling 24.5 cents per gallon.

OUTLOOK

According to the EIA, crude oil prices are expected to remain near recent historical levels. EIA reference case projections are that the average price for oil produced in the U.S. lower 48 states may be $23.61 per barrel in 2010 and $26.72 per barrel in 2025. In the meantime, crude oil averaged a much higher $31.09 a barrel for 2003, and $34.26 per barrel for January 2004. The EIA predicts that federal taxes on motor fuel will not rise, while state taxes are expected to keep up with inflation. As of 2004, an increase in Utah's motor fuel tax has been considered but not yet adopted by the legislature.

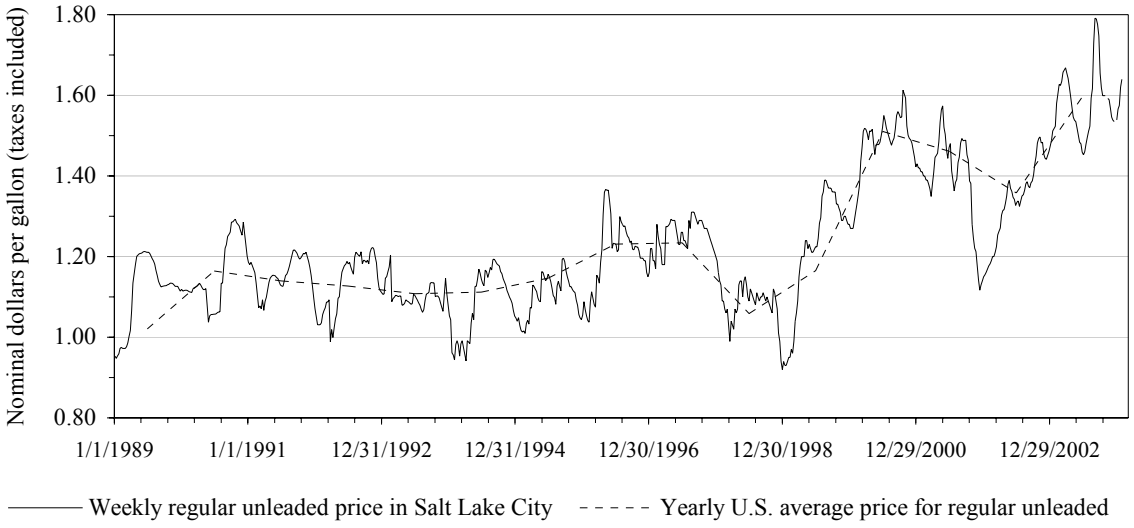

Figure 15. Average weekly regular unleaded motor gasoline prices in Salt Lake City (including taxes), Jan. 5, 1989 - Jan. 29, 2004. Also included is the yearly U.S. average price for regular unleaded.

Source: Oil and Gas Journal

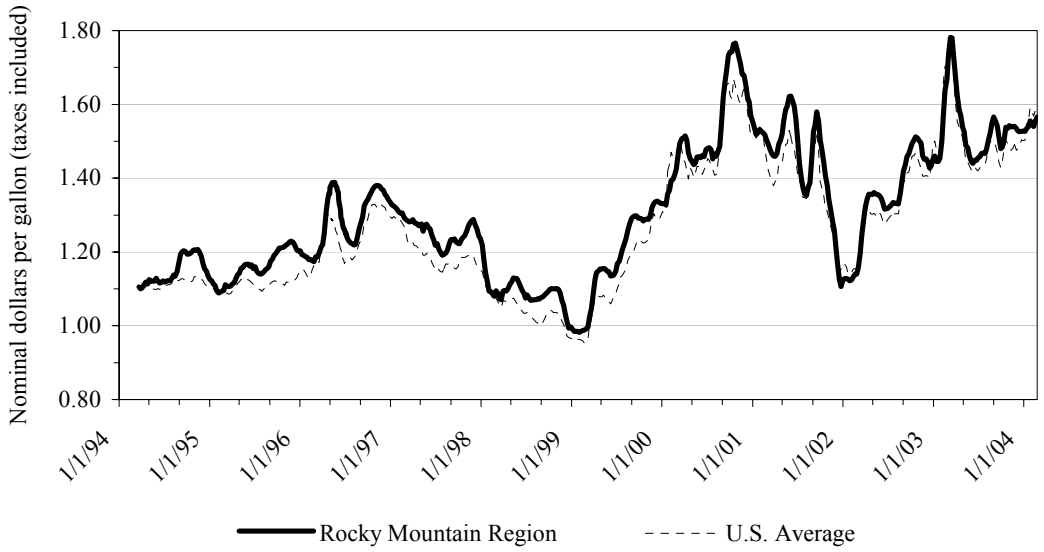

Figure 16. Weekly No. 2 diesel prices (including taxes) for the Rocky Mountain Region (PADD 4) and the entire United States, March 21, 1994 - Feburary 23, 2004.

Source: EIA

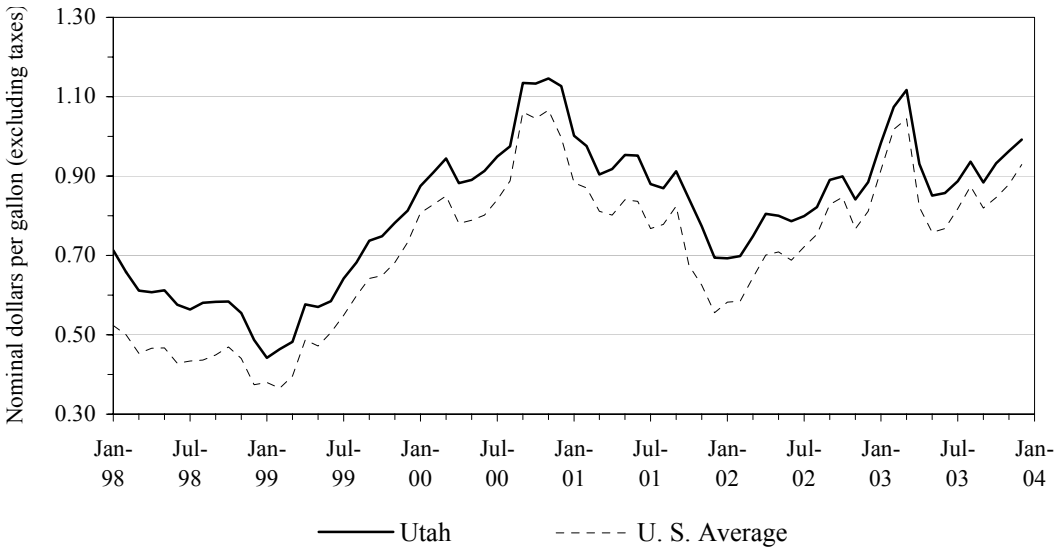

Figure 17. Monthly jet fuel prices for Utah and the United States (excluding taxes), 1998-2003.

Source: EIA

SUMMARY

The most salient feature of Utah's petroleum picture is the continuing decline of production while consumption continues to increase. As time passes, Utah will only become more dependent on out-of-state and foreign oil. Geologists still hope to find large producing fields in Utah, but these new discoveries will have a hard time keeping up with the states increasing appetite for petroleum products. Only new technology, increased conservation and wider use of substitute energy sources will decrease our dependence on petroleum.

GLOSSARY

Asphalt: A dark-brown to black cement-like material containing bitumens as the predominant constituents obtained by petroleum processing.

Aviation Gasoline: All special grades of gasoline for use in aviation reciprocating engines.

Barrel (Bbl): A fluid measure equal to 42 U.S. gallons.

Barrels per Stream Day: The maximum number of barrels of input that a distillation facility can process within a 24-hour period when running at full capacity under optimal crude and product slate conditions with no allowance for downtime.

Btu (British Thermal Unit): The amount of heat needed to raise the temperature of one pound of water by one degree Fahrenheit at or near 39.2 F.

Butane: A normally gaseous, paraffinic hydrocarbon (C_4H_{10}) extracted from natural gas or refinery gas streams. It is used primarily for blending into high-octane gasoline, for residential and commercial heating and for industrial purposes, especially the manufacture of chemicals and synthetic rubber.

Butylene: An olefinic hydrocarbon (C_4H_8) recovered form refinery processes.

Catalytic Cracking: A refining process that consists of using a catalyst and heat to break down the heavier and more complex hydrocarbon molecules into lighter and simpler molecules.

Catalytic Hydrocracking: A refining process that uses hydrogen and catalysts with relatively low temperatures and high pressures for converting middle boiling or residual material to high octane gasoline, reformer charge stock, jet fuel, and/or high grade fuel oil. The process uses one or more catalysts, depending on product output, and can handle high sulfur feedstocks without prior desulfurization.

Catalytic Hydrotreating: A refining process for treating petroleum fractions from atmospheric or vacuum distillation units (e.g., naphthas, middle distillates, reformer feeds, residual fuel oil, and heavy gas oil) and other petroleum (e.g., cat cracked naphtha, coker naphtha, gas oil, etc.) in the presence of catalysts and substantial quantities of hydrogen. Hydrotreating includes desulfurization, removal of substances (e.g., nitrogen compounds) that deactivate catalysts, conversion of olefins to paraffins to reduce gum formation in gasoline, and other processes to upgrade the quality of the fractions.

Catalytic Reforming: A refining process using controlled heat and pressure with catalysts to rearrange certain hydrocarbon molecules, thereby converting paraffinic and naphthenic type hydrocarbons (e.g., low octane gasoline boiling range fractions) into petrochemical feedstocks and higher octane stocks suitable for blending into finished gasoline. Catalytic reforming is reported in two categories. They are: 1) Low Pressure: A processing unit operating at less than 225 pounds per square inch gauge (PSIG) measured at the outlet separator. 2) High pressure: A processing unit operating at either equal to or greater than 225 pounds per square inch gauge (PSIG) measured at the outlet separator.

Crude Oil: A mixture of hydrocarbons that exists in liquid phase in underground reservoirs and remains liquid at atmospheric pressure after passing through surface separating facilities.

Development well: A well drilled within an established field boundary.

Diesel Fuel: A fuel composed of distillates obtained in petroleum refining operation or blends of such distillates with residual oil used in motor vehicles. The boiling point and specific gravity are higher for diesel fuels than for gasoline.

Distillate Fuel Oil: A general classification for one of the petroleum fractions produced in conventional distillation operations. It is used primarily for space heating, on- and off-highway diesel engine fuel (including railroad engine fuel and fuel for agricultural machinery), and electric power generation. Included are products known as No. 1, No. 2 and No. 4 fuel oils and No. 1, No. 2 and No. 4 diesel fuels.

Dry Well: An exploratory or development well found to be incapable of producing either oil or gas in sufficient quantities to justify completion as a commercial oil or gas well.

End User: A firm or individual that purchases products for its own consumption and not for resale (i.e., an ultimate consumer).

Extension Well: A well drilled outside of an existing field boundary with the intent of extending the field's boundary.

Field: An area consisting of a single reservoir or multiple reservoirs all grouped on or related to the same individual geological structural feature. There may be two or more reservoirs in a field that are separated vertically by intervening impervious strata or laterally by local geologic barriers or by both.

Implicit Price Deflator: The implicit price deflator, published by the U.S. Department of Commerce, Bureau of Economic Analysis, is used to convert nominal figures to real figures.

Isobutane: A normally gaseous branch-chain hydrocarbon. It is a colorless paraffinic gas that boils at a temperature of 10.9 degrees F. It is extracted from natural gas or refinery gas streams.

Isobutylene: An olefinic hydrocarbon recovered from refinery processes or petrochemical processes.

Isopentane: A saturated branch-chain hydrocarbon obtained by fractionation of natural gasoline or isomerization of normal pentane.

Jet Fuel: Includes both naphtha-type and kerosene-type jet fuel meeting standards for use in aircraft turbine engines. Although most jet fuel is used in aircraft, some is used for other purposes such as fuel for turbines to produce electricity.

Kerosene: A petroleum distillate that has a maximum distillation temperature of 401 degrees F at the 10 percent recovery point, a final boiling point of 572 degrees F and a maximum flash point of 100 degrees F. Kerosene is used in space heaters, cook stoves and water heaters and is suitable for use as an illuminant when burned in wick lamps.

Lubricants: Substances used to reduce friction between bearing surfaces. Petroleum lubricants may be produced either from distillates or residues. Lubricants include all grades of lubricating oils from spindle oil to cylinder oil and those used in greases.

Motor Gasoline: A complex mixture of relatively volatile hydrocarbons, with or without small quantities of additives, that has been blended to form a fuel suitable for use in spark-ignition engines.

Nominal Dollars: A measure used to express nominal price.

Oxygenates: Substances which, when added to gasoline increase the amount of oxygen in that gasoline blend. Ethanol, Methyl Tertiary Butyl Ether (MTBE), Ethyl Tertiary Butyl Ether (ETBE), and methanol are common oxygenates.

Pentanes Plus: A mixture of hydrocarbons, mostly pentanes and heavier, extracted from natural gas. Includes isopentane, natural gasoline, and plant condensate.

Propane: A normally gaseous, paraffinic hydrocarbon (C_3H_8). It is extracted from natural gas or refinery gas streams. Propane is used primarily for residential and commercial heating and cooling and also as a fuel for transportation. Industrial uses of propane include use as a petrochemical feedstock.

Proved Reserves: The estimated quantities of crude oil that geological and engineering data have demonstrated with reasonable certainty to be recoverable from known crude oil reservoirs under current economic and operating conditions.

Real Dollars: These are dollars that have been adjusted for inflation.

Residual Fuel Oil: The heavier oils that remain after the distillate fuel oils and lighter hydrocarbons are distilled away in refinery operations.

Road Oil: Any heavy petroleum oil including residual asphaltic oil used as a dust palliative and surface treatment on roads and highways.

Special Naphthas: All finished products within the gasoline range, specially refined to a specified flash point and boiling range for use as paint thinners.

Stripper Oil Well: An oil well that produces at relatively low rates. For oil, stripper production is usually defined as production rates of between 5 and 20 barrels of oil per day.

Unfinished Oils: Includes all oils requiring further refinery processing except those requiring only mechanical blending.

Wildcat Well: A well drilled in an unproven area, far from any producing wells.

APPENDIX

Table A **Crude Oil Production in Utah by the 25 Largest Fields, 2002**
Barrels

Rank	Field	County	Year Discovered	Production	Percent of State Production	Cumulative Production	Percent of Cumulative Production
1	Greater Aneth	San Juan	1956	4,776,563	34.69	428,530,012	34.39
2	Bluebell	Duchesne/Uintah	1955	2,020,498	14.67	152,032,890	12.20
3	Monument Butte	Duchesne	1964	1,642,600	11.93	20,553,940	1.65
4	Altamont	Duchesne	1970	647,802	4.70	117,075,598	9.40
5	Anschutz Ranch East	Summit	1980	628,577	4.56	127,039,321	10.20
6	Red Wash	Uintah	1951	478,790	3.48	80,715,046	6.48
7	Natural Buttes	Uintah	1972	446,131	3.24	4,989,429	0.40
8	Brundage Canyon	Duchesne	1984	432,206	3.14	3,729,592	0.30
9	Wonsits Valley	Uintah	1959	428,582	3.11	48,304,053	3.88
10	Antelope Creek	Duchesne	1983	273,123	1.98	4,116,198	0.33
11	Upper Valley	Garfield	1964	210,235	1.53	26,520,200	2.13
12	Walker Hollow	Uintah	1953	201,175	1.46	17,857,586	1.43
13	Pineview	Summit	1975	196,997	1.43	30,708,062	2.46
14	Gypsum Hills	Uintah	1964	81,740	0.59	1,473,833	0.12
15	8 Mile Flat North	Uintah	1983	67,004	0.49	2,681,332	0.22
16	Ashley Valley	Uintah	1929	57,152	0.42	20,462,933	1.64
17	Cedar Rim	Duchesne	1969	55,224	0.40	12,859,692	1.03
18	Kennedy Wash	Uintah	1980	54,815	0.40	332,234	0.03
19	Lisbon	San Juan	1960	54,435	0.40	51,040,386	4.10
20	Uteland Butte	Uintah	1962	52,626	0.38	981,464	0.08
21	Bridger Lake	Summit	1966	50,920	0.37	13,329,810	1.07
22	Windy Ridge East	Uintah	1988	47,964	0.35	590,455	0.05
23	Undesignated			43,427	0.32	1,118,332	0.09
24	Desert Creek	San Juan	1956	33,597	0.24	1,999,410	0.16
25	Cave Canyon	San Juan	1984	33,311	0.24	2,363,661	0.19
	Subtotal			13,015,494	94.51	1,171,405,469	94.01
	State Total			13,771,204		1,246,046,266	

Source: DOGM

Table B **Crude Oil Production in Utah by County, 1998-2002**

Barrels

2002 Rank	County	1998	1999	2000	2001	2002	Percent Change, 2001 to 2002	Cumulative Production Through 2002
1	San Juan	7,302,937	6,764,639	6,151,389	5,503,733	5,191,715	-5.7	531,019,791
2	Duchesne	6,268,634	4,697,532	4,771,287	4,979,765	4,296,480	-13.7	279,947,097
3	Uintah	2,940,615	2,637,875	2,820,120	3,196,788	3,013,476	-5.7	222,874,516
4	Summit	2,341,921	1,911,551	1,477,075	1,240,278	897,549	-27.6	177,297,125
5	Garfield	222,038	220,179	214,266	206,270	210,235	1.9	26,520,200
6	Grand	141,786	140,599	195,383	120,148	120,911	0.6	7,205,459
7	Emery	3,662	1,649	3,279	4,552	2,602	-42.8	674,106
8	Daggett	1,949	1,898	2,696	1,308	1,463	11.9	358,161
9	Carbon	0	527	211	128	46	-64.1	141,967
10	Sanpete	0	72	0	20	0	-100.0	405
11	Washington	0	0	0	0	0	--	4,774
12	Box Elder	0	0	0	0	0	--	2,665
	State Total*	19,218,109	16,361,751	15,609,169	15,273,995	13,771,204	-9.8	1,246,046,266

Source: DOGM

* "State Total" reflects more up-to-date data than the sum of individual counties and hence, may differ from the sum of the parts.

Table C **Crude Oil Production in Utah by the 25 Largest Operators, 2002**
Barrels

Rank	Operator	Production	Percent of State Production	Cumulative Production*	Percent of Cumulative Production
1	ExxonMobil Oil Corp	3,153,994	22.90	56,441,647	4.53
2	Inland Production Co	1,669,431	12.12	11,127,034	0.89
3	El Paso Prod Oil & Gas Co	1,590,635	11.55	2,966,011	0.24
4	Shenandoah Energy Inc	1,191,477	8.65	4,364,848	0.35
5	Chevron USA Inc	825,802	6.00	192,623,589	15.46
6	Devon Energy Prod Co Lp	780,577	5.67	2,225,382	0.18
7	BP America Production Co	632,706	4.59	632,706	0.05
8	Texaco E&P Inc	631,532	4.59	26,370,790	2.12
9	Citation Oil & Gas Corp	607,835	4.41	8,643,388	0.69
10	Williams Prod RMT Co	425,075	3.09	610,325	0.05
11	Flying J Oil & Gas	424,490	3.08	4,237,246	0.34
12	Petroglyph Operating Co	309,290	2.25	2,950,512	0.24
13	Quinex Energy Corp	199,886	1.45	4,212,154	0.34
14	Dominion Expl & Prod Inc	121,528	0.88	280,213	0.02
15	Rim Southwest Corp	118,995	0.86	228,540	0.02
16	US Oil & Gas Inc	86,603	0.63	4,575,356	0.37
17	Journey Operating LLC	86,158	0.63	213,502	0.02
18	Wildrose Resources Corp	67,785	0.49	1,130,370	0.09
19	EOG Resources Inc	59,764	0.43	161,223	0.01
20	Rim Operating Inc	57,559	0.42	163,793	0.01
21	Tom Brown Inc	55,395	0.40	231,372	0.02
22	Merit Energy Co	51,707	0.38	2,373,666	0.19
23	Hunt Petroleum AEC Inc	50,419	0.37	50,419	0.00
24	Equity Oil Co	41,973	0.30	7,643,433	0.61
25	Elm Ridge Resources Inc	39,546	0.29	74,811	0.01
	Subtotal	13,280,162	96.43	334,532,330	26.85
	State Total	13,771,204		1,246,046,266	

Source: DOGM

*Cumulative production numbers will change as companies merge or consolidate. Refer to Utah Division of Oil, Gas, and Mining for historical cumulative production totals for former companies.

Table D **Crude Oil Production in Utah by Landownership, 1960-2002**

Barrels

Year	Federal	Native American	Fee and State	Total
1960	6,026,547	29,908,204	2,497,624	38,432,375
1961	5,793,970	23,771,895	3,560,057	33,125,922
1962	6,921,282	23,312,036	1,974,248	32,207,566
1963	9,499,892	21,769,278	2,320,888	33,590,058
1964	10,532,879	15,630,619	2,359,009	28,522,507
1965	11,200,542	12,092,831	3,967,778	27,261,151
1966	10,551,634	11,012,524	2,546,105	24,110,263
1967	11,753,542	10,883,897	1,537,642	24,175,081
1968	11,374,753	9,736,363	2,708,354	23,819,470
1969	11,200,470	9,162,860	3,155,979	23,519,309
1970	10,755,483	9,578,200	2,972,012	23,305,695
1971	11,020,240	8,703,633	4,151,454	23,875,327
1972	11,572,780	10,022,721	5,034,418	26,629,919
1973	9,170,278	10,253,570	13,363,067	32,786,915
1974	8,155,149	13,346,894	17,727,771	39,229,814
1975	7,859,147	13,916,798	17,772,432	39,548,377
1976	7,068,045	13,083,578	15,232,377	35,384,000
1977	6,598,072	12,123,221	18,594,707	37,316,000
1978	5,757,469	10,959,570	19,047,961	35,765,000
1979	5,217,641	11,266,465	11,168,290	27,652,396
1980	5,357,524	9,597,679	10,023,451	24,978,654
1981	5,741,831	9,014,098	9,553,566	24,309,495
1982	6,442,595	8,274,857	8,877,809	23,595,261
1983	5,178,825	8,693,450	17,172,924	31,045,199
1984	7,060,663	10,871,207	20,122,001	38,053,871
1985	6,973,348	9,541,767	24,564,756	41,079,871
1986	6,512,093	8,182,235	24,549,159	39,243,487
1987	6,516,132	7,800,045	21,512,359	35,828,536
1988	5,869,096	7,161,520	20,334,322	33,364,938
1989	5,795,761	6,762,666	15,945,648	28,504,075
1990	6,003,862	7,193,799	14,507,387	27,705,048
1991	5,279,341	6,638,655	14,009,643	25,927,639
1992	4,593,083	7,681,932	11,798,558	24,073,573
1993	4,286,583	7,837,548	9,701,855	21,825,986
1994	3,179,306	7,290,508	10,197,807	20,667,621
1995	3,878,921	7,167,286	8,929,441	19,975,648
1996	4,760,131	7,949,683	6,818,966	19,528,780
1997	4,626,115	8,299,273	6,667,160	19,592,548
1998	5,023,287	9,022,246	5,172,576	19,218,109
1999	4,017,966	6,000,979	6,342,806	16,361,751
2000	3,560,636	7,124,690	4,923,843	15,609,169
2001	3,109,347	5,905,373	6,259,275	15,273,995
2002*	2,855,950	4,422,564	6,492,690	13,771,204

Source: Minerals Management Service

*UEO estimations, except total

Table E **U.S. Stripper Oil Well Production by State, January 1, 2003**

Rank (by # of wells)	State	Number of Stripper Oil Wells	Production from Stripper Oil Wells	Oil Wells Plugged and Abandoned	Average Daily Production per Well	Total 2002 Oil Production	Percent Production from Stripper Oil Wells
			Bbls		Bbls	Thousand Bbls	
1	Texas	124,551	127,252,695	5,228	2.80	365,817	34.8
2	Oklahoma	56,673	56,299,808	774	2.72	66,030	85.3
3	Kansas	33,317	25,002,372	1,722	2.06	33,343	75.0
4	Ohio	28,850	4,398,074	183	0.42	6,004	73.3
5	California	24,420	35,030,269	2,452	3.93	288,280	12.2
6	Louisiana	20,891	14,999,393	731	1.97	60,378	24.8
7	Kentucky	19,462	2,049,971	237	0.29	2,721	75.3
8	Illinois	17,466	10,720,000	710	1.68	13,250	80.9
9	Pennsylvania	15,470	2,324,000	210	0.41	2,324	100.0
10	New Mexico	13,379	13,386,587	217	2.74	58,293	23.0
11	Wyoming	11,416	8,430,429	228	2.02	54,726	15.4
12	West Virginia	8,210	1,248,000	46	0.42	1,248	100.0
13	Colorado	5,384	4,643,717	119	2.36	19,178	24.2
14	Indiana	4,956	1,962,078	125	1.08	1,962	100.0
15	Michigan	3,428	3,397,608	155	2.72	7,219	47.1
16	Arkansas	3,362	3,087,798	42	2.52	7,344	42.0
17	New York	2,758	174,766	65	0.17	179	97.6
18	Montana	2,274	1,842,960	65	2.22	16,938	10.9
19	Nebraska	1,451	1,717,983	100	3.24	2,779	61.8
20	North Dakota	1,384	2,263,059	55	4.48	30,800	7.3
21	**Utah**	**1,049**	**1,445,945**	**16**	**3.78**	**13,771**	**10.5**
22	Alabama	639	1,141,083	3	4.89	5,174	22.1
23	Mississippi	442	562,190	109	3.48	17,014	3.3
24	Tennessee	424	246,026	38	1.59	316	77.9
25	Missouri	364	95,071	4	0.72	95	100.0
26	South Dakota	22	27,345	1	3.41	1,214	2.3
27	Arizona	17	23,951	0	3.86	63	38.0
28	Virginia	13	3,428	0	0.72	25	13.7
	Totals	402,072	323,776,606	13,635	2.24	2,037,622*	15.9

Source: Interstate Oil and Gas Compact Commission, *Marginal Oil and Gas: Fuel for Economic Growth, 2003*

*Total from all oil producing states, not just ones with stripper wells

Table F **Petroleum Refining Capacity in Utah as of January 1, 2003**

Barrels per Stream Day (except where noted)

Company	Location	Crude capacity		Vacuum Distillation	Thermal Cracking	Catalytic Cracking		Catalytic Reforming		Catalytic Hydrocracking	Catalytic Hydrotreating			Fuel Solvents Deasphalting
		Barrels/calendar day (Operating)	Barrels/stream day (Operating)		Delayed Coking	Fresh	Recycled	Low Pressure	High Pressure		Naphtha Reformer Feed	Distillate	Other/ Residual	
Big West Oil Co.	N. Salt Lake	24,000	25,000	5,000	0	10,000	0	0	5,500	0	7,000	7,000	0	0
Chevron U.S.A.	Salt Lake City	45,000	49,000	27,500	8,500	14,000	0	0	8,000	0	8,300	13,300	7,200	0
Holly Refining and Marketing (formerly Phillips 66 Co.)	Woods Cross	24,700	26,000	5,500	0	8,900	0	0	7,700	0	12,600	1,900	0	5,040
Silver Eagle Refining (formerly Inland Refining Inc.)	Woods Cross	11,000	12,500	6,000	0	0	0	0	2,200	0	2,200	4,000	0	0
Tesoro West Coast	Salt Lake City	58,000	60,000	0	0	23,000	2,200	0	11,600	0	11,600	0	0	0
Utah Total		162,700	172,500	37,300	8,500	55,900	2,200	0	35,000	0	41,700	26,200	7,200	5,040

Company	Location	Alkylates	Aromatics	Asphalt and Road Oil	Isomers		Lubricants	Marketable Petroleum Coke	Hydrogen	Sulfur
					Isobutane	Isopentane & Isohexane			(MMcfd)	(short tons/day)
Big West Oil Co.	N. Salt Lake	1,800	0	0	1,400	1,700	0	0	0	4
Chevron U.S.A.	Salt Lake City	5,600	0	0	1,300	0	0	1,748	0	21
Holly Refining and Marketing (formerly Phillips 66 Co.)	Woods Cross	2,200	0	1,800	0	3,000	0	0	0	10
Silver Eagle Refining (formerly Inland Refining Inc.)	Woods Cross	0	0	1,500	0	0	0	0	1	0
Tesoro West Coast	Salt Lake City	6,000	0	0	0	0	0	0	0	18
Utah Total		15,600	0	3,300	2,700	4,700	0	1,748	1	53

Source: EIA

Table G **Consumption of Petroleum Products in Utah, 1960-2002**

Thousand Barrels

Year	Asphalt and Road Oil	Aviation Gasoline	Distillate Fuel	Jet Fuel	Kerosene	LPG	Lubricants	Motor Gasoline	Residual Fuel	Other Petroleum Products	Total
1960	813	595	3,775	1,003	36	452	214	7,813	5,715	1,926	22,341
1961	687	715	3,040	1,172	212	538	208	8,052	5,783	1,881	22,288
1962	903	532	3,568	1,311	330	511	210	8,455	6,107	2,023	23,950
1963	801	529	3,581	1,237	384	521	210	8,736	5,872	2,065	23,937
1964	791	391	3,749	1,302	564	599	221	8,751	5,519	2,177	24,063
1965	838	383	4,193	1,244	474	677	251	9,001	5,662	2,305	25,029
1966	1,209	370	4,778	1,426	626	595	261	9,554	5,928	2,314	27,060
1967	1,072	312	4,604	1,564	547	836	221	9,819	5,497	2,290	26,761
1968	1,021	251	4,737	1,987	650	928	243	10,712	5,657	2,373	28,559
1969	1,209	223	4,995	1,999	436	959	251	11,476	6,129	2,397	30,075
1970	1,576	178	5,107	1,808	250	939	256	12,308	4,656	2,372	29,450
1971	1,399	168	6,522	1,947	301	1,010	247	12,958	5,076	2,336	31,965
1972	1,804	179	6,403	1,963	378	1,223	265	14,052	4,494	2,487	33,247
1973	1,419	172	8,028	1,889	361	1,080	305	14,614	3,638	2,549	34,054
1974	1,571	187	8,906	1,864	198	1,096	292	14,439	4,222	2,796	35,571
1975	1,219	161	9,165	1,903	146	1,169	232	15,063	4,603	2,731	36,391
1976	1,661	161	8,484	1,828	112	1,219	257	15,741	4,768	2,731	36,961
1977	1,823	174	8,797	2,034	113	928	299	16,509	4,543	2,534	37,754
1978	1,699	164	9,168	2,164	112	841	321	17,478	4,122	2,632	38,701
1979	1,903	147	9,610	2,302	158	1,658	336	16,480	3,187	2,628	38,409
1980	1,477	139	8,401	2,637	102	1,301	299	15,534	3,495	2,598	35,983
1981	927	140	7,098	2,424	155	1,546	287	15,548	1,022	1,665	30,812
1982	933	76	6,438	2,801	192	1,523	262	15,793	855	1,692	30,563
1983	820	103	6,387	3,284	58	1,577	274	15,954	1,600	2,259	32,316
1984	1,340	78	6,107	3,413	49	1,387	292	16,151	953	2,359	32,129
1985	1,576	94	5,715	3,808	31	1,486	272	16,240	431	2,155	31,809
1986	1,295	110	6,978	4,335	24	1,542	266	17,541	360	1,955	34,406
1987	1,429	99	6,507	4,969	30	1,652	301	17,623	357	2,205	35,172
1988	1,069	112	7,060	4,977	25	1,432	290	18,148	288	2,569	35,971
1989	1,671	106	5,917	5,095	11	1,386	298	17,311	250	2,649	34,694
1990	1,378	106	7,162	5,281	13	1,074	307	16,724	367	2,670	35,082
1991	2,870	118	7,038	5,917	17	747	274	17,395	200	2,357	36,933
1992	1,633	133	7,286	5,607	4	696	280	17,905	245	2,736	36,524
1993	1,730	114	7,422	5,518	9	779	285	18,837	285	2,444	37,422
1994	1,819	88	7,653	5,270	9	784	298	19,433	343	2,579	38,275
1995	2,179	64	8,469	5,658	6	1,531	292	20,771	294	2,453	41,718
1996	2,361	52	8,746	6,303	9	2,621	284	21,170	87	2,996	44,628
1997	1,992	61	9,976	6,277	12	750	300	22,024	149	2,985	44,526
1998	2,452	51	10,398	6,373	13	430	314	22,735	96	2,583	45,446
1999	2,380	73	9,793	7,443	13	1,013	317	23,141	60	2,573	46,806
2000	2,295	84	10,629	7,701	13	1,804	312	23,895	71	2,375	49,179
2001	1,441	76	11,236	6,880	17	1,988	286	22,993	18	3,004	47,939
2002*	2,076	67	10,900	7,039	17	2,065	300	23,806	31	2,668	48,969

Source: EIA

*UEO estimations

Table H **Federal and State Motor Fuel Taxes, July 1, 2003**

Cents per gallon

Rank (by Motor Gasoline)	State	Motor Gasoline	Diesel Fuel	Gasohol
1	Rhode Island	30.00	30.00	30.00
2	Wisconsin	28.50	28.50	28.50
3	Washington	28.00	28.00	28.00
4	Montana	27.00	27.75	27.00
5	Pennsylvania	25.90	30.80	25.90
6	West Virginia	25.35	25.35	25.35
7	Connecticut	25.00	26.00	24.00
7	Idaho	25.00	25.00	22.50
9	Maine	24.60	25.70	24.60
9	Nebraska	24.60	24.60	24.60
11	**Utah**	**24.50**	**24.50**	**24.50**
12	North Carolina	24.20	24.20	24.20
13	Kansas	24.00	26.00	24.00
13	Ohio	24.00	24.00	24.00
13	Oregon	24.00	24.00	24.00
16	Maryland	23.50	24.25	23.50
17	Delaware	23.00	22.00	23.00
17	Nevada	23.00	27.00	23.00
19	Colorado	22.00	20.50	22.00
19	New York	22.00	20.25	22.00
19	South Dakota	22.00	22.00	20.00
22	Arkansas	21.50	22.50	21.50
23	Massachusetts	21.00	21.00	21.00
23	North Dakota	21.00	21.00	21.00
25	Iowa	20.03	22.50	19.00
26	Dist. of Columbia	20.00	20.00	20.00
26	Louisiana	20.00	20.00	20.00
26	Minnesota	20.00	20.00	20.00
26	Tennessee	20.00	17.00	20.00
26	Texas	20.00	20.00	20.00
26	Vermont	20.00	26.00	20.00
32	New Hampshire	19.50	19.50	19.50
33	Illinois	19.00	21.50	19.00
33	Michigan	19.00	15.00	19.00
35	New Mexico	18.90	19.90	18.90
36	Mississippi	18.40	18.40	18.40
37	Alabama	18.00	19.00	18.00
37	Arizona	18.00	18.00	18.00
37	California	18.00	18.00	18.00
37	Indiana	18.00	16.00	18.00
41	Virginia	17.50	16.00	17.50
42	Missouri	17.00	17.00	17.00
42	Oklahoma	17.00	14.00	17.00
44	Kentucky	16.40	13.40	16.40
45	Hawaii	16.00	16.00	16.00
45	South Carolina	16.00	16.00	16.00
47	Wyoming	14.00	14.00	14.00
48	Florida	13.60	25.90	13.10
49	New Jersey	10.50	13.50	10.50
50	Alaska	8.00	8.00	8.00
51	Georgia	7.50	7.50	7.50
	Federal	18.40	24.40	13.20
	Average State Tax	20.51	20.96	20.38

Source: EIA

Table I **Petroleum Product Thermal Conversion Factors**
Million Btu per Barrel

Petroleum Product	Heat Content
Crude oil - Production	5.800
Asphalt	6.636
Aviation Gasoline	5.048
Butane	4.326
Butane-Propane Mixture (60/40)	4.130
Distillate Fuel Oil	5.825
Ethane	3.082
Ethane-Propane Mixture (70/30)	3.308
Isobutane	3.974
Jet Fuel, Kerosene-Type	5.670
Jet Fuel, Naphtha-Type	5.355
Kerosene	5.670
Lubricants	6.065
Motor Gasoline	
Conventional	5.253
Oxygenated	5.150
Reformulated	5.150
Fuel Ethanol	3.539
Natural Gasoline	4.620
Pentanes Plus	4.620
Petrochemicals Feedstocks	
Naphtha less than 401 degrees F	5.248
Other Oils equal to or greater than 401 degrees F	5.825
Still Gas	6.000
Petroleum Coke	6.024
Plant Condensate	5.418
Propane	3.836
Residual Fuel Oil	6.287
Road Oil	6.636
Special Naphthas	5.248
Still Gas	6.000
Unfinished Oils	5.825
Unfractionated Stream	5.418
Waxes	5.537
Miscellaneous	5.796

Source: EIA

Utah Energy Office
Department of Natural Resources

1594 West North Temple, Suite 3610
P.O. Box 146480
Salt Lake City, UT 84114-6480

TAKE Pride IN UTAH